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(19) **United States**(12) **Patent Application Publication****Meijer et al.**(10) **Pub. No.: US 2009/0102805 A1**(43) **Pub. Date: Apr. 23, 2009**(54) **THREE-DIMENSIONAL OBJECT  
SIMULATION USING AUDIO, VISUAL, AND  
TACTILE FEEDBACK**(75) Inventors: **Erik Meijer**, Mercer Island, WA  
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**G06F 3/041** (2006.01)(52) **U.S. Cl.** ..... **345/173**(57) **ABSTRACT**

A multi-sensory experience is provided to a user of a device that has a touch screen through an arrangement in which audio, visual, and tactile feedback is utilized to create a sensation that the user is interacting with a physically-embodied, three-dimensional ("3-D") object. Motion having a particular magnitude, duration, or direction is imparted to the touch screen so that the user may locate objects displayed on the touch screen by feel. In an illustrative example, when combined with sound and visual effects such as animation, the tactile feedback creates a perception that a button on the touch screen moves when it is pressed by the user like a real, physically-embodied button. The button changes its appearance, an audible "click" is played by the device, and the touch screen provides a tactile feedback force against the user's finger.

100